A. Title: Application for Permit for Scientific Purposes under the Endangered Species Act of 1973.

Project Name: Monitoring and evaluation of habitat restoration at Crims Island and tide gate removal at Julia Butler Hansen National Wildlife Refuge.

B. Species: Spring/summer Chinook salmon
- Snake River ESU
- Upper Columbia River ESU
- Lower Columbia River ESU
- Upper Willamette River ESU

Fall Chinook salmon
- Snake River ESU
- Lower Columbia River Tule ESU

Steelhead
- Snake River DPS
- Upper Columbia River DPS
- Mid Columbia River DPS
- Lower Columbia River DPS
- Upper Willamette River DPS

Sockeye salmon
- Snake River ESU

Coho salmon
- Lower Columbia River ESU

Chum salmon
- Lower Columbia River ESU

C. Date of Permit Application: June 14, 2006

D. Applicant Identity:

Applicant: Kenneth F. Tiffan, Research Fishery Biologist
U.S. Geological Survey
Western Fisheries Research Center
5501A Cook-Underwood Rd.
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Principal contact: Dena Gadomski, ESA Permit Coordinator
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E. Information on Personnel, Cooperators, and Sponsors:

1. Principal Investigators:
   Kenneth F. Tiffan
   U.S. Geological Survey
   (see address above)

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   Lower Columbia River Program Office
   9317 Hwy 99
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   Field Supervisors:
   Craig Haskell, Fishery Biologist
   U.S. Geological Survey
   (see address above)
   Sam Lohr
   U.S. Fish and Wildlife Service
   (see address above)

2. Field Personnel:
   John Olson (USGS, 509-538-2299)
   Ken Tiffan (USGS, 509-538-2299)
   Joe Warren (USGS, 509-538-2299)
   John Brunzell (USFWS, 360-696-7605)
   Travis Collier (USFWS, 360-696-7605)
   Mark Fain (USFWS, 360-696-7605)
   Jeff Hogel (USFWS, 360-696-7605)
   Robert Horal (USFWS, 360-696-7605)
   Jeff Johnson (USFWS, 360-696-7605)
   Bao Le (USFWS, 360-696-7605)
   Christina Luzier (USFWS, 360-696-7605)
   Jennifer Poirier (USFWS, 360-696-7605)
   Greg Silver (USFWS, 360-696-7605)
   Joe Zydlewski (USFWS, 360-696-7605)

3. Secured Funding Sources: Funding has been secured from the U.S. Army Corps of Engineers for FY06.

   U.S. Army Corps of Engineers
   Portland District

P.O. Box 2946
Portland, OR 97212
Blaine Ebberts (503-808-4763)

Proposed Funding Sources: Funding for monitoring and evaluation of habitat restoration of Crims Island in FY07 is in progress but may be funded by the USGS.

A preliminary proposal for funding pre- and post-replacement monitoring and evaluation of tidegates at Julia Bulter Hansen National Wildlife Refuge has been made to the U.S. Army Corps of Engineers.

Cooperators:
U.S. Fish and Wildlife Service
Lower Columbia River Program Office
9317 Hwy 99
Vancouver, WA 98665
360-696-7605

4. Contractors:
   None
5. Disposition of tissue samples, dead specimens, or other remains: We will retain carcasses of all salmonids that die as a result of our sampling activities. Carcasses will be preserved (formalin fixative and then 70% EtOH) after we record pertinent biological information (e.g., species, length, presence of tags). We will maintain the specimens and tissue samples (scales) at the Columbia River Research Laboratory (CRRL) and make them available to authorized researchers, museums, or fish health centers.

6. Transport and long-term holding of listed species: No listed species will be transported or held for the activities listed in this permit application.

F. Project Description, Purpose, and Significance:

The loss of wetland habitat in the lower Columbia River and Estuary has been well documented. It is estimated that 20,000 acres of tidal swamps, 10,000 acres of tidal marshes, and 3,000 acres of tidal flats have been lost by diking, dredging, and filling (Northwest Power and Conservation Council 2001). The original extent of tidal marsh and swamp in the estuary has been reduced by more that half. Estuary wetlands provide habitat for all Columbia basin salmon stocks at some period in their life cycle, and habitat loss has been detrimental to salmonids.

Crims Island is located at Columbia River miles 54-57 on the Oregon side of the navigation channel. The island is approximately 0.5 miles wide at its widest location and 2.5 miles long. The Columbia River flanks Crims Island to the north and Bradbury Slough flanks the island to the south. Fish habitat at Crims Island is currently in a degraded condition and consists of two straight, steep banked, ditched waterways and reed canarygrass dominated areas. Tidal circulation is limited by berms that surround much of the project area and the configuration of the ditch. The U.S. Army Corps of Engineers recently completed a restoration of tidal marsh,

mudflat, side channel, and riparian forest habitats on Crims Island in 2005 to benefit many fish and wildlife species in the lower Columbia River and estuary. This habitat restoration project specifically provides juvenile salmonid rearing and foraging habitat. Listed species likely to benefit will be subyearling chum salmon (*Oncorhynchus keta*) and Chinook salmon (*Oncorhynchus tshawytscha*). Restored riparian forest habitat will benefit endangered Columbian white-tailed deer (*Odocoileus virginianus leucurus*). Collections made under this permit will occur as part of monitoring and evaluation of this project.

The Bonneville Power Administration provided funding to the Columbia Land Trust for the acquisition of 423 acres on Crims Island in 2003, which encompasses the main area for restoration activities. Ownership of this land was transferred to the U.S. Fish and Wildlife Service (USFWS) and is now a part of the Julia Butler Hansen National Wildlife Refuge. The U.S. Army Corps of Engineers (COE) provided funding for pre-project monitoring and post-restoration monitoring. This permit will cover collections made during post-restoration monitoring. The monitoring will be conducted by the U.S. Geological Survey (applicant).

A second project sought for coverage under this permit is monitoring and evaluation of fish associated with sloughs and drainage ditches that may have tidegates replaced at Julia Butler Hansen NWR. Julia Butler Hansen NWR is located at about Columbia River mile 34 in Washington. A 4-mile-long levee surrounds the refuge. Six tidegates and an expulsion pump regulate water within a network of sloughs and drainage ditches.

Historically much of the area was once a tidally influenced Sitka Spruce swamp that was flooded twice daily. Once dikes were constructed and most of the trees were cut, the drier sites were transformed into pastures and hayfields. Dikes, tidegates, natural sloughs, and drainage ditches control flooding during periods of high tides and heavy winter rainfall.

In September 2003, a failing culvert with a tidegate was replaced with a larger diameter culvert and a self-regulating tidegate with funding from the U.S. Army Corps of Engineers. The intent of this design is to allow for improved fish passage by remaining open longer during the tidal cycle. Combined with a substantially larger culvert, the design is expected to reduce water velocity and increase tidal exchange, resulting in greater access for juvenile anadromous fish, reduced water temperatures, and overall improved water quality in the channel behind the new tidegate. The USFWS is working with the U.S. Army Corps of Engineers to develop a monitoring and evaluation plan that would assist in determining the effects of new tidegates on fish and aquatic habitats and the priority of the remaining tidegates for replacement.

1. **Justification of the objectives:**

<u>*Crims Island*</u> - The restoration of habitat on Crims Island involved enhancing 90 acres of tidal emergent marsh by excavating reed canarygrass wetland, creating a network of dendritic tidal channels, and connecting subtidal channels to the mainstem Columbia River. The approach and scale of this project is without precedent and results from this project will be useful in similar restoration projects in the Columbia River estuary. The objectives of this study involve determining the biological community response to restoration of tidal marsh habitat on Crims Island. The objectives described below are for post-restoration assessment to address fish response to habitat change.

Objective 1: *Describe the seasonal use by juvenile salmon and other fishes of existing backwater and tidal marsh habitats at reference sites at Crims Island.*
Justification –Both subyearling chum and Chinook salmon will likely be the primary benefactors of this habitat restoration project. It will be necessary to sample fish throughout the spring rearing period to document when these species are abundant and what habitat variables influence their use of nearby reference habitats and restored habitats. Information from this objective will also be necessary to evaluate whether fish use of restored habitat is similar to that in reference sites.
Objective 2: *Describe ingress/egress of juvenile salmonids and organic material to Crims Island backwaters and tidal marsh.*
Justification – The ability of juvenile salmonids to find their way into and out of restored habitat is critical for the habitat to benefit fish. Fish sampling will be necessary to evaluate residence time, behavior, and growth in restored habitat. These metrics are ultimately related to survival, which the restoration project aims to increase. This sampling along with evaluating the production and movement of organic material will allow us to determine what ecosystem processes are functioning in the restored habitat. If the basic elements of ecosystem function are not restored along with the habitat, then the success of this and future restoration projects may be questionable.
Objective 3: *Describe juvenile salmon diet and the invertebrate community in existing reference sites and restored habitats at Crims Island*.
Justification – Fish will be sampled to obtain diet information, which is necessary to compare food production and consumption between reference and restored habitats. For a growth and survival advantages to be realized, food quality and quantity should be similar between habitats. As in Objective 2, this information will be used to measure the relative productive capacity of restored habitats as a measure of project success and benefit to listed species.

Julia Butler Hansen - The tidegate project at Julia Butler Hansen NWR involves the replacement of old tidegates on sloughs and drainage ditches with new self-regulating tidegates to improve quality of aquatic habitats and access for juvenile anadromous salmonids to areas potentially used for rearing. The monitoring and evaluation plan under development by the USFWS and U.S. Army Corps of Engineers will likely use an approach comparing conditions at a site before and after a tidegate is replaced, as well as comparing potential responses to conditions observed at a reference site (i.e., a slough with unimpeded connectivity with the Columbia River). This permit will cover post-tide gate replacement monitoring.

Objective 1: *Characterize water quality, aquatic habitats, and fish assemblages in sloughs and drainage ditches behind existing tidegates at the refuge and at a reference site.*
Justification – The intent of this work is to characterize physical and biological attributes of the sites to assist in determining the feasibility of installing new tidegates and prioritizing them. The work would also generate preliminary data (i.e., prior to tidegate replacement) for sites ultimately selected for new tidegate installation. Comparisons with a reference site will assist in determining the relative rankings of various attributes among the sites with existing tidegates.

Objective 2: *Characterize water quality, aquatic habitats, fish assemblages, and movement of juvenile anadromous salmonids in sloughs and drainage ditches behind replaced tidegates at the refuge and at a reference site.*

Justification – The intent of this work is to characterize physical and biological attributes, especially movement of juvenile anadromous salmonids, at sites after old tidegates have been replaced with new self-regulating tidegates. Comparisons would be made at a site for variables collected before and after tidegate replacement, and between sites with tidegates and the reference site. These comparisons will provide an evaluation of effects attributed to the new tidegates.

2. Federal agency relations:

This project addresses Reasonable and Prudent Action (RPA) 160 in the 2000 Federal Columbia River Power System Biological Opinion issued by the National Marine Fisheries Service, which calls for protecting and enhancing 10,000 acres of tidal wetlands and other key habitats over the next 10 years to rebuild productivity in the lower 46 miles of the Columbia River and its estuary. Although Crims Island is outside of this area, it has been deemed an important restoration site because of its proximity to the estuary and its potential to contribute organic material to the estuary. This project also addresses RPA 157, which calls for improving and restoring tributary and main-stem habitat for Columbia River chum salmon. The restoration of habitat at Crims Island will provide rearing habitat for chum salmon fry. This project also addresses RPA 158, which requires the COE and BPA to develop and action plan to rapidly inventory estuarine habitat, and develop criteria for estuarine habitat restoration. This project serves as an example of a restoration project that would be used to develop and refine criteria for future estuarine restoration projects. Finally, RPA 159 requires the BPA and COE to develop a plan that addresses the habitat needs of salmon and steelhead in the estuary. Enhancement of tidal marsh and channels at Crims Island would serve as an example of a project that addresses several major habitat needs of anadromous fish in the estuary and lower Columbia River—restoration and reconnection of floodplain habitat with the Columbia River, restoration of rearing habitat and high flow refugia for juvenile salmon, and restoration of macrodetritus input to the riverine/estuarine system.

3. Broader significance of project:

The restoration of tidal marsh habitat on Crims Island will serve as an example to guide other habitat restoration efforts in the Columbia River estuary and in other estuaries. The fish sampling methods used to measure the effects of this restoration will likely be used to develop sampling and monitoring protocols for the entire estuary. This project is part of a larger plan to restore 10,000 acres of tidal marsh habitat for juvenile salmonids in the Columbia River estuary (see RPA 160 above).

4. Relationship to other projects:

The proposed project would complement other projects to restore tidal wetlands and monitor salmonid use in the estuary. Some of these include:

- The Grays Bay Estuary Project. The Columbia Land Trust, Ducks Unlimited, USFWS, Washington Department of Fish and wildlife (WDFW), Natural Resources Conservation Service, National Fish and Wildlife Foundation, and Lower Columbia Fish Recovery Board

are cooperating to acquire, restore, and enhance 350 acres of tidally influenced palustrine forested wetland. Monitoring of fish use is a critical element of this project.

- Lord Island Protection. The Columbia Land Trust purchased Lord Island to preserve the habitat values of more than 200 acres of tidal wetland and riparian forest.
- The Klaskanine River Estuary Project. The Columbia Land Trust and Ducks Unlimited are restoring of tidal wetlands.
- The Chinook River Estuary Project. WDFW, Columbia Land Trust, Ducks Unlimited, USFWS, and Lower Columbia Fish Recovery Board are restoring estuarine intertidal emergent marsh in 1,100 acres of the Chinook River Estuary.
- *Estuarine habitat and juvenile salmon – current and historic linkages in the lower Columbia River and estuary*. Project EST-P-02 of the U.S. Army Corps of Engineers Anadromous Fish Evaluation Program. This project specifically examines a broad range of ecosystem functions that relate to juvenile salmonid habitat use of estuarine habitats.

5. Justification for using listed species:

This project does not specifically target the collection of federally listed species. Rather, the collection of any listed fish species will be a small part of regular sampling and monitoring activities. The population of juvenile salmon that uses habitats at Crims Island represents a mix of predominantly unlisted species and some listed species, and distinguishing between the two will not be possible. The purpose of this permit is to cover the take of any listed that might be collected and handled during the evaluation of the Crims Island restoration project. Because number and identification on any listed species that might be encountered is unknown, there are no alternatives to potentially handling listed species and take estimates will be derived by assuming that listed species are randomly mixed with unlisted species.

G. Proposed Methodology:

1. Proposed project duration: The restoration of Crims Island began in 2004 and was completed in 2005. We anticipate subsequent monitoring and evaluation to last for 4 years beginning in 2007 (expiration in 2011). Fish will be collected from February through August each year.

2. Procedures and techniques:

Capture and release: Juvenile salmon will be collected with beach seines and fykenets. A 100'X6' beach seine (3/16" mesh size) with a "many-ends-mud line" (to avoid collecting mud in the seine) will be used to collect fish in low velocity areas. In tidal channels, we will passively collect juvenile salmon using a fyke net on incoming and outgoing tides. The fyke net has leads measuring 50'x 4' with 3/16" mesh. The leads connect to a 4'x4' meshed frame that has a series of v-shaped baffles that guide fish into sanctuary area. Backpack electrofishing will be conducted with a Smith-Root model 24 unit following current backpack electrofishing guidelines (NMFS 2000). Boat electrofishing will be conducted using a newly developed LR-1500 unit that is expected to be available from Smith-Root in spring 2003. The LR-1500 offers expanded control over electrofishing settings (e.g., frequency settings less than 40 Hz, fine voltage regulation) compared to other units used on boats, such that the unit can be operated at a low power density to avoid injuries to fish (J. Johnson, USFWS, pers. comm.). Boat electrofishing will be conducted from a 3.8-m Zodiac that has been modified by Smith-Root specifically for use with the LR-1500 unit. If we encounter an adult anadromous salmonid during backpack or boat

electrofishing, we will immediately disengage power to allow individuals to escape from the electric field and move away from the area. All field personnel will be trained specifically to avoid fish injury based on current literature. Because our intent is to document species composition and relationships to habitat variables, all electrofishing will consist of a single pass through all sample areas. Electrofishing may be conducted at Crims Island and/or at Julia Butler Hansen NWR to evaluate restoration and tidegate effectiveness. Fish collected by all sampling methods will be held in 19-L buckets or holding tubs of aerated water for no more than 15-30 minutes. All individuals will be enumerated and their species, capture method, and location will be recorded. A sufficient number of fish will be anesthetized with methanesulfonate (MS-222, 5-25 mg/L) to record lengths and weights from a sample of up to 50 individuals of each species. Anesthetized fish will then be placed in buckets of fresh water and allowed to recover before being released.

To describe diets of juvenile salmonids, we propose to remove stomach contents from fish using gastric lavage (reviewed in Kamler and Pope 2001). Contents will be lavaged using a 30 cc syringe with a 100µL pipette tip affixed to the end. This approach as been demonstrated to be highly efficient (>95%) and results in virtually no mortality (USGS, unpublished data). Our intent is to collect stomach contents from a sufficient number of fish so that each size class (e.g., 1 cm) of a species is represented by up to 10 individuals during each monthly sample. All fish will be anesthetized prior to collecting stomach contents, and they will be allowed to recover in a bucket of aerated water before being released.

a. **Description of tagging:** We propose to mark juvenile salmonids using a fluorescent elastomer injection on an appropriate area of the body (Guy et al. 1996) or with a Pan-jet needleless inocculator. We intend to vary the color and location (different fins) of injection so that we may estimate residence time and ingress/egress rates of salmonids in restored and reference habitats if marked fish are recaptured. We may also use PIT tags to evaluate residence times and ingress/egress rates. All PIT tagging will be done in accordance with protocols established by the Columbia Basin Fish and Wildlife Authority's PIT Tag Steering Committee (PSMFC 1999). No fish smaller than 65 mm fork length will be tagged. All fish that are tagged will be lightly anesthetized, tagged or marked, and then allowed to recover in aerated holding containers.
b. **Description of drugs used:** Fish will be anesthetized in groups of 5-10 fish in a 5-25 mg/L buffered solution of MS-222. Fish will be allowed to fully recover for 15 minutes before being released. Fish may also be batch marked with calcein, a flourochrome dye. Captured fish are immersed in a bath of oxygenated calcein solution for 5 minutes and immediately released. Calcein leaves a permanent fluorescent mark on the scales and bony structures of fish that can be identified using a specific ultraviolet light reader. The calcein mark is invisible to the naked eye and can only be seen with the aforementioned ultraviolet detector. We will use data from recaptured fish to estimate residence times and growth of marked individuals. This technique has already been successfully used to mark Atlantic salmon fry without increased predation risk (Mohler et al. 2002). This drug is still awaiting FDA approval, however the USGS will be become registered as a member of an INAD (Investigational New Animal Drug) for initial use of this product.

c. **Temporary holding:** All fish will be held in net pens or buckets of fresh water (no more than 50-100 fish per bucket). Battery powered aerators and air stones will be place in each bucket and net pen to ensure water remains aerated. No fish will be transported or held for more than 20 minutes.
d. **Samples collected:** Only scale samples will be collected under this permit if fish are marked with calcein. This is a nonlethal procedure that involves removing 3-5 scales from the side of a fish and releasing the fish. Scales will be stored in envelopes. Samples of stomach contents collected by the non-lethal lavage technique described in G.2. above will be placed in Whirl-paks and immediately frozen with dry ice. Samples will be stored at -80°C prior to analysis.

3. Potential for injury and mortality: All fish will be handled as carefully as possible to avoid injury. Precautions to avoid injury include adjusting electrofishing units to collect fish at the lowest possible settings, minimizing time that fish are held in containers of aerated water, and ensuring that anesthetized fish are allowed sufficient time to recover prior to release. We will also follow fish marking and gastric lavage techniques that have been found to induce minimal injury. Fish will be maintained in water at all times. Fish will be transferred from nets to buckets using sanctuary nets. Battery powered aerators and air stones will be place in fish holding containers to ensure water remains aerated. No fish will be held for more than 20 minutes. Fyke net traps will be emptied every hour to minimize any potential overcrowding with resident species collected concurrently. Any large fish (e.g., carp or suckers) that could potentially injure juvenile salmon will be removed from beach seines and fyke nets at first opportunity.

H. Description and Estimates of Take:

1. **Species and ESUs:** Because Crims Island and the Julia Butler Hanson National Wildlife Refuge are located along the lower Columbia River, individuals of listed anadromous fish populations and DPSs from upstream areas in the Columbia River basin may be present at times. We are requesting take authority for listed and candidate species that may occur at the refuge. These include: Chinook salmon (Lower Columbia River ESU, Snake River Fall-run ESU, Snake River Spring/Summer-run ESU, Upper Columbia River Spring-run ESU, Upper Willamette Spring-run ESU); coho salmon (Lower Columbia River ESU); chum salmon (*O. keta*; Columbia River ESU); sockeye salmon (*O. nerka*; Snake River ESU); and steelhead (Lower Columbia River DPS, Upper Columbia River DPS, Snake River Basin DPS, Middle Columbia River DPS, Upper Willamette DPS).
2. **Sampling schedule and location:** We request to sample fish from the Columbia River estuary to Portland, Oregon to cover any future work that might arise in the lower Columbia River. We will specifically sample at Crims Island, River Mile 54-57. Specific sites at Crims Island will be established and sampled for fish on a biweekly basis from mid February through July, and then on a monthly basis for the remainder of the year. The latitude and longitude for the main sampling and restoration area on Crims Island are N46.17163 and W123.14225.

3. **Status of fish to be taken:** The five species of anadromous fishes that we are requesting take authority consists of 12 listed and candidate ESUs. Of these, two are listed as endangered (Upper Columbia River Spring-run Chinook salmon and Snake River sockeye salmon), and the remainders are listed as threatened.
4. **Estimated annual take:** See Table 1.
5. **Estimated potential annual mortalities:** Our study design does not include sacrificing fish so that there will be no direct (intentional) mortalities of listed species. Because adult salmonids are not likely to inhabitat tidal habitats on Crims Island, we do not anticipate any indirect (unintentional) mortalities of adult fish. We suspect that there may be some indirect mortalities due to handling juvenile fish. We estimated mortalities based on the assumption of a maximum mortality rate of 5% of all juvenile salmonids handled. To calculate indirect mortality presented in Table 1, the maximum 5% mortality rate was applied to the anticipated annual take of juvenile salmonids for each ESU and their appropriate components (e.g., listed ESUs with various runs or with listed naturally- and hatchery-produced individuals). The resulting value was then rounded down to the next whole number for fractional values less than 0.50 and rounded up for fractional values greater than or equal to 0.50.
6. **Take estimates:** Sampling conducted from 2003 to 2006 indicates we might expect to collect 7,500 juvenile Chinook salmon, 500 juvenile coho salmon, and 1,000 juvenile chum salmon annually. Although neither adult salmonids of any species nor juvenile sockeye salmon and steelhead were collected in the past, we assumed that up to 5 adults of all species and up to 50 juvenile sockeye salmon and 50 juvenile steelhead may be encountered during each year of our study. We assume that similar numbers of fishes are likely to be sampled during the tidegate evaluation project at Julia Butler Hanson NWR, so that our estimates are based on double the previous fish abundance numbers.

   Because the annual estimates for number of individuals encountered during the study were based on species, we apportioned the values to estimate anticipated annual take of listed ESUs and they're various components. Proportions were based on information in the memo "Estimation of percentages for listed Pacific salmon and steelhead smolts arriving at various locations in the Columbia River basin in 2006" (J. Ferguson, NMFS, June 13, 2006). We used proportions of juvenile salmonids arriving at Tongue Point in the Columbia River estuary under the full transportation with spill scenario to calculate anticipated annual take.

   For Chinook salmon, we assumed that of the 10,500 individuals we estimated to encounter, that most, or 10,000 would be subyearling fall Chinook salmon. We assumed the remaining 500 fish would be yearling spring/summer Chinook salmon. These values were multiplied by the proportion of listed fish for each run, and then the values of listed fish in each run were multiplied by the proportions for each ESU and its appropriate components. All chum salmon below Bonneville Dam were listed (i.e., 250 individuals). For steelhead, we just added one from each ESU, and we did the same for sockeye. Estimates for each ESU and its components are presented in Table 1.

I. Transportation and Holding: N/A

J. Cooperative Breeding Program: We are willing to cooperate with any entity engaged in a breeding program of ESA listed species.

K. Previous or Concurrent Activities Involving Listed Species:

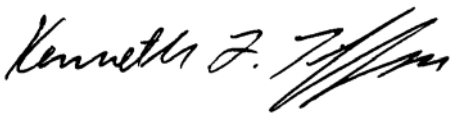
1. **Previous Permits:** Section 10 scientific research permit 1036. This permit covered the take of Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), Snake River spring/summer Chinook salmon, and Upper Columbia River steelhead (*O. mykiss*). This permit became Research Action 1036 of the NMFS 2000 CRFPS Biological Opinion. The USFWS was issued permit 1421 to conduct fish surveys at Franz Lake NWR.
2. **Species, mortality, preventative measures:** The following mortalities were incurred under permit 1036 during the last five years:
   2002: Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), 43 unintentional mortalities (12 from beach seining and PIT tagging, 31 from electrofishing).
   2001: Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), 1 unintentional mortalities, and 1 lethally sampled.
   2000: Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), 8 unintentional mortalities and 66 lethally sampled.
   1999: Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), 2 unintentional mortalities.
   1998: Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), 6 unintentional mortalities and 66 lethally sampled.

   Unintentional mortalities that occurred under permit 1036 were primarily due to capture and handling. Sometimes a rock may get caught in a beach seine and crush juvenile salmon and is the probable cause of the mortalities listed here. This is not likely to occur at Crims Island because the predominant substrate is sand and silt. Measures taken to reduce mortality during beach seining include stopping the seining process when rocks are suspected in the seine, maintaining captured fish in aerated buckets, and ceasing PIT tagging when temperatures exceed 22ºC. Considering that only 12 listed fish died during beach seining activities in 2002, in which over 12,000 fish were caught, these measures are successful in reducing mortality.

   To date, no listed species have been encountered during surveys conducted at Franz Lake NWR under permit 1421.

L. Certification:

I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand this information is submitted for the purpose of obtaining a permit under the Endangered Species Act of 1973 (ESA) and regulations promulgated thereunder, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or to penalties under the ESA.



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Kenneth F. Tiffan, Research Fishery Biologist Date

Table 1. Anticipated annual take of salmonids with listed ESUs or considered candidates at Crims Island and the Julia Butler Hanson National Wildlife Refuge (JBHNWR).

Number of individuals	Species, population, ESU	Life stage	Sex	Origin	Take activity category	Location	Dates	Indirect mortality
Fall Chinook salmon								
1	Snake River	subyearling	N/A	Naturally-produced	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	0
1	Snake River	subyearling	N/A	Hatchery AD clipped	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	0
1	Snake River	subyearling	N/A	Hatchery no AD clip	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	0
11	Snake River	subyearling	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
11	Snake River	subyearling	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
10	Snake River	subyearling	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
200	Lower Columbia R. Tule	subyearling	N/A	Naturally-produced	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	2
240	Lower Columbia R. Tule	subyearling	N/A	Hatchery AD clipped	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	3
179	Lower Columbia R. Tule	subyearling	N/A	Hatchery no AD clip	capture, diet sample, mark, release	Crims Island / JBHNWR	January-December	2

Number of individuals	Species, population, ESU	Life stage	Sex	Origin	Take activity category	Location	Dates	Indirect mortality
1,841	Lower Columbia R. Tule	subyearling	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	19
2,237	Lower Columbia R. Tule	subyearling	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	23
1,625	Lower Columbia R. Tule	subyearling	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	17
2	Snake River	yearling	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Snake River	yearling	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
Spring/Summer Chinook salmon								
17	Snake River spring/summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
5	Snake River spring/summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
3	Upper Columbia R. spring/summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Columbia R. spring/summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Columbia R. spring/summer	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0

Number of individuals	Species, population, ESU	Life stage	Sex	Origin	Take activity category	Location	Dates	Indirect mortality
17	Lower Columbia R. spring/summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
6	Lower Columbia R. spring/summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
2	Lower Columbia R. spring/summer	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
70	Upper Willamette R. spring/summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	2
13	Upper Willamette R. spring/summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Willamette R. spring/summer	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
Coho salmon								
212	Lower Columbia R.	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	2
1,783	Lower Columbia R.	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	18
258	Lower Columbia R.	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	3
Sockeye Salmon								

Number of individuals	Species, population, ESU	Life stage	Sex	Origin	Take activity category	Location	Dates	Indirect mortality
1	Snake River	juvenile	N/A	naturally-produced, artificially-propagated	capture, release	Crims Island / JBHNWR	January-December	0
Chum salmon								
250	Lower Columbia R.	juvenile	N/A	naturally-produced	capture, release	Crims Island / JBHNWR	January-December	12
Steelhead								
1	Snake River	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Snake River	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Snake River	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Columbia R.	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Columbia R.	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Columbia R.	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0
1	Mid Columbia R. Summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Mid Columbia R. Summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Mid Columbia R. Summer	juvenile	N/A	Hatchery no AD clip	capture, release	Crims Island / JBHNWR	January-December	0

Number of individuals	Species, population, ESU	Life stage	Sex	Origin	Take activity category	Location	Dates	Indirect mortality
1	Mid Columbia R. Winter	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Mid Columbia R. Winter	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Lower Columbia R. Summer	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Lower Columbia R. Summer	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Lower Columbia R. Winter	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0
1	Lower Columbia R. Winter	juvenile	N/A	Hatchery AD clipped	capture, release	Crims Island / JBHNWR	January-December	0
1	Upper Willamette R. Winter	juvenile	N/A	Naturally-produced	capture, release	Crims Island / JBHNWR	January-December	0

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